

THE RELATIONSHIP OF SPECIALIZED MUSIC INSTRUCTION
AND SOCIOECONOMIC LEVEL TO SCORES ON THE
GORDON MUSICAL APTITUDE PROFILE

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CHAPTER I

INTRODUCTION

One of the primary concerns of educators has been the development of children's capacities to their fullest extent. The problem of determining basic abilities of children has challenged all those committed to the ideal of education of the individual according to his needs, interests, and abilities. If, as Jones stated, the aim of the American school is "to provide all children with an education suited to their aptitudes,"¹ then it is the professional responsibility of educators to discover to what degree these aptitudes, abilities, interests, and needs exist in children.

In no phase of education is the presence of individual differences more manifest than in music. Dykema and Cundiff stated that:

It is a fact beyond dispute that all children are not born equally musical and that their native musical ability is a large factor in determining what they may accomplish in the study of music.²

Hence the teacher has been confronted with the need for finding a way to assess these innate abilities. The selection and use of a good measuring device which in fact

¹Archie N. Jones (ed.), Music Education in Action (Boston; Allyn and Bacon, Inc., 1960), p. 345.

²Peter Dykema and Hannah M. Cundiff, School Music Handbook (Boston: C. C. Birchard and Company, 1955), p. 477.

does disclose the nature of a child's aptitudes can be of great value in helping the teacher to better provide for each child's optimal musical development.

In order to serve as an evaluative aid, a test which purports to measure aptitude should fulfill certain criteria. It should indicate potentialities from which an estimate of capacity for future accomplishment can be inferred.¹ It does not presuppose previous training, and reveals no significant correlation with sex, age, intelligence, or background.² Its purpose is "to measure the specific musical capacities which constitute musicianship."³

I. THE PROBLEM

Statement of the problem. It was the purpose of this study to investigate the effects of specialized instruction and socioeconomic level on test scores on the Gordon Musical Aptitude Profile⁴ and to evaluate the validity of the Musical Aptitude Profile as an aptitude test in relation to these two factors.

Importance of the study. "For more than fifty years," stated Gordon, "music educators and psychologists

¹Walter Van Dyke Bingham, Aptitudes and Aptitude Testing (New York: Harper and Brothers, 1937), p. 11.

²Jacob Kwalwasser, Tests and Measurements in Music (Boston: C. C. Birchard and Company, 1927), p. 1.

³Ibid.

⁴Edwin Gordon, Musical Aptitude Profile (Boston: Houghton Mifflin Company, 1965).

have debated the issue of musical aptitude."¹ To this day, there is no generally agreed criterion or definition of musical ability. Attempts to measure it have met with varying amounts of success. The nature of these attempts has depended more upon belief than upon scientifically proved conclusions.² It follows that the status of the validity of music aptitude tests is, in the least, questionable. In addressing himself to this point, Horner observed that, "evaluations by psychologists and musicologists throw doubt upon the usefulness of numerous tests unless they are validated by further experimental application."³

The relationships between Musical Aptitude Profile scores and a variety of variables, which were investigated during an eight year test development period⁴ bear directly upon the validity and reliability of the test battery. From these studies, Gordon concluded that "the effects of environmental factors and musical training on aptitude test performance appear to be relatively minimal."⁵

¹Ibid., p. 1.

²Arnold Bentley, Musical Ability in Children and its Measurement (New York: October House, 1966), p. 14.

³V. Horner, Music Education (Victoria, Australia: Australian Council for Educational Research, 1965), p. 7.

⁴Edwin Gordon, A Three-Year Longitudinal Predictive Validity Study of the Musical Aptitude Profile (University of Iowa Studies in the Psychology of Music, Vol. V, Iowa City, University of Iowa Press, 1967), p. 4.

⁵Ibid.

However, other studies dealing with the relationship between musical aptitude, environment, and training have proved inconclusive. The present study was undertaken to further examine these factors as they relate to the validity of the Musical Aptitude Profile.

Limitations of the study. Educators are well aware of the importance and value of the testing programs which have become an integral part of our educational system. However, it is also generally agreed that no one test score can be regarded as an absolute indication of potential for accomplishment. Tests of musical aptitude, in particular, are limited by the fact that they cannot measure many of the factors which may influence musical success. Such factors as interest and motivation for musical study, background, parental encouragement, and physical coordination are also of considerable importance to success in music. These variables cannot be wholly accounted for in any test and to this extent the Musical Aptitude Profile cannot be considered a "perfect" instrument for assessing musical aptitude.¹

It is the extent to which these variables affect test scores which was under question. This study was limited to investigating the effects of instruction and socioeconomic level, as these two extra-musical criteria

¹Edwin Gordon, Musical Aptitude Profile (Boston: Houghton Mifflin Company, 1965), p. 1.

were felt by the researcher to be most significant.

The Gordon Musical Aptitude Profile was used in this study for three reasons: (1) the battery was administered for the first time in the Des Moines Public Schools at the time of this study; (2) it was administered to all fifth grade students; and (3) computerized results for all students were readily available.

II. DEFINITIONS OF TERMS USED

Target area school. The definition of target area school, for the purpose of this study, was the one used by the Des Moines Public School District. A target area school is one in which the school attendance in the area is based on a high concentration of children from low income families, the level of income being defined by the Federal Government. Federal funds are allocated on this basis for special projects in these schools.¹

Non-target area school. A non-target area school is any school in the Des Moines system other than a target area school.

Print-out. The print-out is the sheet containing a complete analysis of test scores, school by school, in terms of standard scores and percentile ranks. A total of

¹Department of Pupil Personnel, Des Moines Independent Community School District, Des Moines, Iowa.

eleven scores are provided for each student: seven sub-test scores, three composite scores, and a grand composite score.

Standard score. A standard score is "a converted or derived score found by expressing an obtained score as being so far above or below the mean in Standard Deviation units."¹ The standard score on the Musical Aptitude Profile has a mean of fifty and a standard deviation of ten for the total weighted distribution of scores for all students in grades four through twelve.²

Mean. The mean is the "arithmetic average of a set of test scores."³

Percentile scale. The percentile scale is one into which obtained scores "can be fit into a scale of 100 units The percentile rank of a score is its position on the percentile scale."⁴ Percentile ranks are useful in evaluating a student's relative standing in the group.

Norm. The norm is the "average performance for various groups - expressed as age or grade equivalents for school children."⁵

¹Henry E. Garrett, Testing for Teachers (New York: American Book Company, 1959), p. 258.

²Gordon, op. cit., p. 29.

³Garrett, op. cit., p. 257.

⁴Ibid., p. 33.

⁵Ibid., p. 257.

Validity. "The validity of any evaluation process depends upon the extent to which test scores or the results of other evaluative techniques accurately reflect what they are intended to measure."¹

Reliability. "Reliability may be defined as the consistency with which the test measures whatever it does measure."²

III. PROCEDURE

Permission was obtained from the Department of Music of the Des Moines Public School District to conduct this study and to use the test results. The computerized data used in reporting the results were furnished by the Polk County Board of Education. Procedural advice on the experimental design of the study was provided by the following people: (1) Dr. Carroll Childs, Director of Music, Des Moines Public School System; (2) Dr. Edwin Gordon, author of the Musical Aptitude Profile and Professor of Music Education at the University of Iowa; (3) Dr. Carl Fehrle, Assistant Professor of Education, Drake University, Des Moines, Iowa; and (4) Dr. Ralph Wagoner, Assistant Professor of Education, Drake University.

¹Theodore Torgerson and Georgia Adams, Measurement and Evaluation (New York: Holt, Rinehart, and Winston, 1954), p. 47.

²Ibid., p. 53.

The available literature on the nature of musical aptitude and musical aptitude testing was reviewed. The design and use of the Musical Aptitude Profile were also examined with special reference to standardization procedures, norms, reliability, and validity of the battery.

Students used for the study were selected from a random stratified sample of fifth grade students in the Des Moines Public Schools. Schools were randomly chosen from those in target areas, non-target areas, schools in which the classroom teacher taught his own music, and schools in which a certified music teacher was responsible for the fifth grade music program.

Sixty students were selected to represent each of the groups, with a total of 240 students in the entire sample.

Each school and each student was given an Identification Number by the Polk County Board of Education for the purpose of computerizing the data. The test results were analyzed by an IBM 1401 Computer, and three print-outs containing standard scores and percentile ranks were sent to the Department of Music, Des Moines Public Schools.¹

Test scores were tabulated, using the grand composite standard score of each student. From this, the group mean for each of the four groups under study was determined. A test to determine the statistical difference between the

¹Dr. Marvin Ingle, Director of ACCESS, Polk County Board of Education, in a telephone conversation, May 8, 1968.

means was employed for the following combinations of variables:

1. All students receiving specialized music instruction versus all students receiving classroom music instruction.
2. All students in target areas versus all students in non-target areas, regardless of training.
3. Students in non-target areas receiving specialized music instruction versus students in target areas receiving specialized music instruction.
4. Students in non-target areas receiving classroom music instruction versus students in target areas receiving classroom music instruction.
5. Students in non-target areas receiving specialized music instruction versus students in non-target areas receiving classroom music instruction.
6. Students in target areas receiving specialized music instruction versus students in target areas receiving classroom music instruction.
7. Students in non-target areas receiving specialized music instruction versus students in target areas receiving classroom music instruction.
8. Students in non-target areas receiving classroom music instruction versus students in target areas receiving specialized music instruction.

These combinations of variables were used to determine the effects of training (1), socioeconomic level (2), socioeconomic level, with training held constant (3 and 4),

training, with socioeconomic level held constant (5 and 6), and both factors considered together (7 and 8). The validity of the Musical Aptitude Profile was evaluated on the basis of these findings.

CHAPTER II

REVIEW OF THE LITERATURE

In order to secure a deeper insight into the problem under study, a review of current literature related to the topic of aptitude was undertaken. An attempt was made in this chapter to present pertinent findings of authorities in the field of music education. A full understanding of the problem necessitated a study of the research dealing with (1) the nature of aptitude and aptitude testing; (2) the nature of musical aptitude and the current status of musical aptitude testing; and (3) the content and development of the Musical Aptitude Profile.

I. APTITUDE - THEORY AND TESTING

The nature of aptitude. In seeking a definition of aptitude, many writers have employed such terms as "capacity," "potentialities," "propensity," and "innate ability." All these expressions seem to focus on one main theme - that aptitude is some natural, inborn ability of a person which enables him to acquire certain skills, and which may serve as an indication of future accomplishment in a given area.

According to Révész, aptitude is "that inborn capacity of a person that enables him to realize and develop certain general or specific types of behavior."¹

¹G. Révész, Introduction to the Psychology of Music (Norman: University of Oklahoma Press, 1954), p. 141.

Aptitude merely signifies a natural propensity which may be developed through interaction with environmental factors.¹

Following this line of thought, Bingham stated that:

Aptitude, then, is a condition symptomatic of a person's relative fitness, of which one essential aspect is his readiness to acquire proficiency - his potential ability²

Bingham further advanced the premise that the concept of aptitude carried with it these basic assumptions: (1) an individual's potentialities are not all equally strong; (2) individuals differ from one another in their potentialities; (3) many of these differences are relatively stable; and (4) changes which subsequently take place occur within the limits imposed by the individual's basic constitution.³

If aptitude is, as most authorities believe, a relatively stable function, then it can be assumed that each of the factors determining a person's potential will remain fairly constant, and that changes which may take place will occur only within limits which can often be ascertained in advance. Aptitude tests are instruments which seek to measure this potential.

Aptitude testing. Musical aptitude or talent tests attempt to measure native musical ability in terms of certain

¹Ibid.

²Bingham, op. cit., p. 18.

³Ibid., p. 24.

basic factors which constitute the individual's musical inheritance. Once this ability is known, the necessary steps can be taken to provide the various experiences for the child which will result in the desired concepts, skills, attitudes, and appreciations.

There exist, among educators and psychologists, differences of opinion concerning the degree to which aptitude tests should be used in determining the direction of a child's education. However, there is agreement that in order to teach successfully, the teacher of today must know all he can about the needs, tastes, and capacities of each individual child. Whereas there are certain things that all children must learn, their methods and rates of learning vary enormously. Each child has special abilities that play a highly important part in determining the amounts of various things he learns and the emphasis given to certain phases of his learning. The object of aptitude tests is to present one means of assessing these individual differences so as to better provide appropriate instruction and guidance.

Kwalwasser contended that the purpose of aptitude testing was to aid the teacher in adapting materials and procedures of teaching to the nature and needs of the pupils.¹ He went on to list the following values of aptitude testing:

1. Aptitude tests may be used for the discovery of talent hitherto unrecognized and undeveloped.

¹Jacob Kwalwasser, Tests and Measurements in Music (Boston: C. C. Birchard and Company, 1927), p. 8.

2. The tests show the magnitude of individual differences.
3. Aptitude tests reveal deficiencies that may or may not be suspected.
4. Tests may aid the teacher in adapting the training to the needs and nature of the child.
5. Tests may be employed by the teacher as an aid in evaluating the quality of a pupil's work.¹

Mursell and Glenn, as early as 1938, revealed the advantages of aptitude testing to both student and teacher. It was their position that the results from such tests could give considerable information about the probable development of a child, and aid in diagnosing certain weaknesses that might otherwise go undetected. They also believed that tests could help to select from a large group those pupils with greater ability who might profit from specialized instruction.²

Brooks and Brown, after a careful examination of the subject, justified the giving of aptitude tests in this way:

. . . it is a fact that all significant information about children's knowledge and abilities, even though it is not as complete and as applicable as might be desired, contributes something to the teacher's insight and understanding of the pupils whom she teaches.³

Thus far, all the observations about aptitude tests have pointed toward the positive side. Pierce examined the

¹Ibid., pp. 14-15.

²James Mursell and Mabell Glenn, The Psychology of School Music Teaching (New York: Silver Burdett Company, 1938), p. 325.

³B. Marian Brooks and Harry A. Brown, Music Education in the Elementary School (New York: American Book Company, 1946), p. 291.

subject from another point of view and presented the arguments of those opposing testing. She summarized their viewpoints as follows:

1. Tests cannot measure the one thing necessary for success - namely interest or desire to succeed.
2. It is impossible to get accurate data from tests given only once.
3. Few teachers have the background or training necessary to interpret tests correctly or to know what to do with the results.
4. The good teacher can analyze the strengths and weaknesses of pupils without tests.¹

Despite these shortcomings which can be attributed to many standardized tests, such tests cannot be dismissed as entirely worthless. The fact remains that a carefully conceived test maintains an important position in the overall diagnosis of children's capabilities. Aptitude testing is valuable to the extent that it helps teachers, counselors, administrators and others to do a better job of educating children. In summation, Noll concluded that:

Few would question that measurement has done much to help appraise what we do in education, to take education out of the realm of opinion and provide many facts, and to point out ways in which the job can be done better.²

The usefulness of any test is judged in part by its ability to fulfill certain criteria. The determination of the value of the test depends upon several factors. These factors include:

¹Anne E. Pierce, Teaching Music in the Elementary School (New York: Henry Holt and Company, 1959), p. 34.

²Victor H. Noll, Introduction to Educational Measurement (Boston: Houghton Mifflin Company, 1965), p. 12.

1. Validity. The test must measure what it sets out to measure.
2. Reliability. A test is regarded as reliable to the degree that it gives the same results with the same group of students under the same circumstances in repeated testings.
3. Ease, Convenience, and Economy. The requirements for administering a test should not be so complex as to make it impracticable for use; nor should the pupil's success be dependent upon the skill of the administrator. Cost, although not a factor relating to the quality of a test, does determine practicability.
4. Adaptability to Different Situations. The good test should be adaptable to various group or school situations and should lend itself to being easily transcribed and scored.
5. Usefulness of Information. Test findings should be significant, and should provide direction for future teaching.¹

These characteristics represent some of the basic requirements of a good measuring device. To further qualify as an aid in evaluating aptitude, a test must meet certain additional criteria. A soundly planned and carefully constructed aptitude battery should represent the most objective

¹Russel N. Squire, Introduction to Music Education (New York: The Ronald Press Company, 1952), pp. 132-134.

and reliable measure of a student's potential available to the teacher. To this end, it is designed to maximize the function of aptitude by minimizing the effects of such factors as intelligence, age, sex, socioeconomic status, and prior training. Thus, aptitude tests "are designed to measure potential or promise. They do not pre-suppose training in a particular field, but purport to measure an individual's capacity to profit from instruction in that field."¹

Undoubtedly there are many factors which, in their subtlety, are not easily identifiable and cannot be wholly accounted for in any test. The greater effectiveness of a test to control various extraneous factors lends to the reliability and validity of test results.

There are three essential phases in the construction of a valid test. The first phase involves the setting up of a working concept of the function or process to be tested. The second phase is concerned with assembling and selecting test items which in the experience and judgment of the maker are likely to reveal the trait, characteristic, or function as conceived. The final phase deals with validation, wherein the completed test is checked against outside criteria.² Because validity is of primary importance, researchers must present evidence to support claims concerning the

¹Noll, op. cit., p. 314.

²James Mursell, Psychological Testing (New York: Longmans, Green and Company, 1949), pp. 34-39.

characteristics that their tests measure. A number of validation techniques are used to accomplish this.

Logical or curricular validity is obtained when the investigator analyzes the particular ability that he intends to appraise and structures an instrument to measure the various aspects of that factor. This type of validity, sometimes referred to as content validity is many times determined by inspection rather than by quantitative analysis.¹

Designers of aptitude tests also endeavor to establish empirical validation by means of internal consistency and correlation with some accepted criterion. The method of internal consistency attempts to determine the extent to which the test has the power to discriminate between subjects of varying abilities.

A test item is said to discriminate if the pupils who answer it correctly receive higher scores on the total test than those who do not. Thus, to ascertain the discriminating power of test items, each item score is correlated with the total test score.²

Validity can also be established by correlation with various external criteria. Anastasi classified some of the major types of criteria as: (1) correlation between the new test and previously available tests which purport to measure the same function; (2) ratings of ability by experts in the field under carefully controlled conditions; (3) academic

¹M. J. Nelson, E. C. Denny, and A. P. Coladarci, Statistics for Teachers (New York: Holt, Rinehart, and Winston, 1956), p. 142.

²Deobold Van Dalen, Understanding Educational Research (New York: McGraw-Hill Book Company, 1962), p. 265.

achievement based upon teacher ratings, grades, or special honors; (4) analysis of contrasting groups involving a composite criterion which reflects the cumulative and uncontrolled selective effects of everyday life; and (5) on the job performance involving vocational success and follow-up records of actual performance in the field.¹

The nature of the selected criterion measure is very important for, too often, investigators do not select the criterion with sufficient care and, as a result, users of the test are misled by a high validity coefficient. Therefore, the selection of an aptitude test must be based on a careful examination and evaluation not only of content but of validation procedures.

Research has also indicated the existence of certain factors which question the validity of the aptitude instruments themselves. Although many aptitude tests have been adjudged to be reliable, there are, according to Smith, Krouse, and Atkinson, factors which may enable the student to obtain a higher score than his aptitude would justify. They cited such examples as prior experience in the field, an innate capacity for handling the various concepts needed in the field, or familiarity with the testing situation which permitted him to do better on the test than he normally would have.²

¹Anne Anastasi, Psychological Testing (New York: The Macmillan Company, 1954), pp. 237-245.

²Edward Smith, Stanley Krouse, and Mark Atkinson, The Educator's Encyclopedia (Englewood Cliffs: Prentiss-Hall, Inc., 1961), p. 414.

Bearing all these facts in mind, it remains that the merit of any aptitude test must be judged by its ability to conform to certain standard criteria, and by its applicability in the individual situation.

With a background in the theory of aptitude and aptitude testing having been established, the next step was to try to pinpoint the nature of musical aptitude relative to the formulation of musical aptitude tests.

II. MUSICAL APTITUDE - THEORY AND TESTING

The problem of the nature of musical ability is actually two-fold. The first aspect concerns the matter of what is included in musical ability, and the second concerns how it comes about. Measurement of the various phases of musical ability demands a comprehensive statement of the nature of this ability and its origin. Unfortunately, music educators have not been able to agree upon one theory, and present research does not reveal a generally acceptable definition of musical ability. The conflicting points of view center on two issues: (1) whether musical ability is composed of several specific abilities or is a unified, coordinated phenomenon; and (2) whether musical ability results principally from native endowment or musical experience.

One of the earliest workers in the field of music aptitude, Seashore, worked from the point of view that music can be analyzed into its component parts, and that a

"hierarchy of talents" could be measured.¹ He stated that:

Musical talent is not one, but a hierarchy of talents There seem to be four large trunks in the family tree of musicality, each of which may develop and ramify to a large extent independently of, or out of proportion to the others.²

Seashore considered musical talent to be composed of four primary elements: (1) Tonal, which is made up of a sensitivity for pitch and is related to melody and harmony; (2) Dynamic, which is related to acuity of hearing; (3) Temporal, which deals with aspects of rhythm and time; and (4) Qualitative, which involves sensitivity for quality of sound.³

Seashore believed that the way to test the composite, referred to as musical talent, was to measure each of the capacities in turn as an individual ability. His "theory of specifics"⁴ and test battery that resulted set the pattern for many tests that followed.

A view which lies close to that of Seashore's, and may be said to be a variation of the theory of specifics was set forth by Schoen. Schoen agreed that music is made up of a number of capacities, but differed from Seashore as to what the capacities are. The specific talents he

¹Carl E. Seashore, Psychology of Music (New York: McGraw-Hill Book Company, 1938), p. 288.

²Ibid., p. 2.

³Robert W. Lundin, An Objective Psychology of Music (New York: The Ronald Press Company, 1953), p. 179.

⁴Ibid., p. 177.

recognized were musical feeling, musical understanding, musical sensitivity, and musical virtuosity. These he considered to be primary factors which, in conjunction with the secondary factors of self-confidence, will power, intelligence, and temperament, totaled musical ability.¹

Seashore placed greater importance on sensory capacities; Schoen emphasized the intellectual side of the musical mind.

The opposing viewpoint, that musical ability is a single, albeit complex, ability was advanced by Mursell. In his "omnibus theory" he proposed the idea that musicality was more than the sum of special sensory abilities.² He believed that "musical ability is not an inherited special sensory capacity or an array of such capacities,"³ but rather a combination of mental processes. In The Psychology of Music Mursell stated:

We must not think of musicality as a faculty or instinct, or a special ability or trait marked off from all other mechanisms of the mind Musicality depends on and consists of an awareness of tonal-rhythmic configurations or tonal patterns and an emotional responsiveness thereto.⁴

Mursell associated musical ability with general high

¹Horner, op. cit., p. 17.

²James L. Mursell, Human Values in Music Education (New York: Silver Burdett and Company, 1943), p. 363.

³James L. Mursell, The Psychology of Music (New York: W. W. Norton and Company, 1937), p. 368.

⁴Ibid.

grade traits of mind, cultural interests, personality, and physique, and asserted that highly musical persons typically had high linguistic, artistic, and mathematical ability.¹

The noted music educator, Lundin, expressed an inter-behavioral point of view in which musical ability "is not a single trait but a number of interrelated behaviors."² These acquired behaviors could be built up through a process of interaction of individual organisms with musical stimuli through a person's life.³

Many modern researchers have come to believe that what is called musical talent is not a single, fixed ability but a combination of powers, the basis for each of which is inborn but is dependent for its development upon environment. Gordon acknowledged that music aptitude, like intelligence, is normally distributed among human beings and is "comprised of several aptitudes which are developed through the interaction of innate potential with environmental influences."⁴

The influence of environment and training has not been studied to any great extent by past researchers. Most designers of music aptitude tests contend that the innate quality of the ability is not affected by training or

¹James L. Mursell, Human Values in Music Education (New York: Silver Burdett and Company, 1943), p. 368.

²Lundin, op. cit., p. 176.

³Ibid.

⁴Edwin Gordon, How Children Learn When They Learn Music ([Edwin Gordon], 1968), p. 1.

environmental background. Studies based on Seashore's test battery have shown that musical training does not affect test results.¹ Kwalwasser, author of the Kwalwasser Music Talent Test, stated that training is incapable of giving an individual more talent; it merely utilizes the talent one possesses.² Yet, on the other hand, Gehrkins maintained that talent is frequently so susceptible to training that it is often difficult to tell how much was inborn and how much had been trained.³ The results of studies of the effects of training and background on Musical Aptitude Profile scores will be discussed separately in the last section of this chapter.

The vigorous controversies which have grown out of differing conceptions of the nature of musical aptitude have affected the status of present talent tests, and the ways of establishing their validity. In general, attempts to validate many of these tests have met with little success, as designers cannot agree upon what constitutes an acceptable criterion.

Mursell proposed that tests be validated in relation to external criteria such as the ability to sing at sight, the ability to play the piano, and various other musical

¹Squire, op. cit., p. 141.

²Kwalwasser, op. cit., p. 4.

³Karl W. Gehrkins, Music in the Public Schools (Boston: C. C. Birchard and Company, 1934), p. 11.

competencies.¹ Seashore, who maintained that his tests were valid because they measure exactly what they purport to measure, was not in favor of the use of external criteria measures. He believed that the criteria may be less reliable than the tests themselves, and that the real criteria of validity could be found in the internal consistency of the test.²

Jordon held that the only criteria for judging the validity of music aptitude tests was success in music courses.³ However, studies reported in the Encyclopedia of Educational Research revealed that attempts to validate tests against the criterion of success have been very disappointing.⁴

Still another validation method was presented by Whistler and Thorn. They contended that validity could best be achieved by correlating tests with teachers' estimates of a pupil's vocal and instrumental talent and his performance in music clubs, bands, and orchestras.⁵

Because of these divergent viewpoints, there has

¹Charles Leonhard and Robert House, Foundations and Principles of Music Education (New York: McGraw-Hill Book Company, 1959), p. 343.

²Ibid., p. 344.

³Horner, op. cit., p. 179.

⁴Chester W. Harris, Encyclopedia of Educational Research (New York: The Macmillan Company, 1960), p. 907.

⁵Horner, loc. cit.

been much disagreement as to the reliability and validity of many of the music aptitude tests now in use, and many authorities have questioned the advisability of using such tests for diagnostic purposes, unless they can be further validated through experimental application.

Horner did note that, in recent years, some new trends in music measurement have become evident. He pointed out that there is an increasing demand for objectivity in measurement, coupled with an interest in tests of more complex musical functions. Horner foresaw more stringent application of the principles of validity and reliability to music tests,¹ for the clarification of objectives and the determination of criteria against which test results can be validated are fundamental to the development of better measuring instruments.

Many of the recent trends described by Horner are evident in the Musical Aptitude Profile. Gordon attempted to maintain the objectivity of the measure by supplying many types of statistical data as evidence of test quality. The results of the research conducted during and after the test development period relating to validity of the Profile will be discussed following an examination of the design and use of the test battery.

¹Horner, op. cit., p. 174.

III. THE MUSICAL APTITUDE PROFILE

The Musical Aptitude Profile was developed by Dr. Edwin Gordon, Professor of Music Education, at the University of Iowa. More than eight years of systematic research went into designing an instrument which would measure the musical aptitude of students from fourth through twelfth grades.

The test has one major purpose: "to act as an objective aid in the evaluation of students' basic musical aptitude so that the teacher can better provide for individual needs and abilities."¹ Such evaluation may also be used for the following purposes:

1. To identify musically talented students who can profit most from and contribute most to school music activities.
2. To adapt music methods and materials to the individual needs and abilities of students by compensating for their specific weaknesses and by enhancing their specific musical strengths.
3. To aid in the formulation of educational plans in music.
4. To compare the collective musical aptitudes of groups of students.
5. To appraise parents of the musical aptitudes of their children.²

Description of the test. The abilities measured by the Musical Aptitude Profile are classified into three main

¹Edwin Gordon, Musical Aptitude Profile (Boston: Houghton Mifflin Company, 1965), p. 2.

²Edwin Gordon, A Three-Year Longitudinal Predictive Validity Study of the Musical Aptitude Profile (University of Iowa Studies in the Psychology of Music, Vol. V. Iowa City: University of Iowa Press, 1967), p. 1.

divisions: Tonal Imagery, Rhythm Imagery, and Musical Sensitivity. The first two divisions, Tonal Imagery and Rhythm Imagery are non-preference tests, as there is one correct and best answer for each item. The third division, Musical Sensitivity, is a preference test which is intended to measure musical taste. Two separate subtests are provided for each of the non-preference divisions. They are Melody and Harmony for the Tonal Imagery division, and Tempo and Meter for the Rhythm Imagery division. Musical Sensitivity, the third division, involves three separate subtests, namely, Phrasing, Balance, and Style.

Each of the four non-preference subtests consists of forty items, and each of the preference subtests contains thirty items, with a total of 250 exercises for the complete battery. The tests, including practice exercises and directions, are recorded on high fidelity magnetic tape.

The tests are not concerned with historical or technical facts about music, and require no prior formal music training. Students are asked to compare a musical selection with a musical answer and decide whether the selection and answer are alike or different, or exactly the same or different. In the preference tests, students must indicate which of two renditions of the same selection represents a more tasteful performance. If the student cannot answer a question, he may indicate he is "in doubt."

Eleven test scores are obtained for the battery: one score for each of the seven subtests, a composite score

for each of the three divisions, and a grand composite score for the entire battery.

Standardization procedures. The Musical Aptitude Profile was nationally standardized during the 1964-1965 school year using a representative sample of public school students in grades four through twelve. The schools were selected on the basis of procedures developed for the Project Talent study conducted by the American Institute for Research in cooperation with the United States Office of Education.¹ A total of 12,809 students enrolled in twenty school systems in eighteen states were included in the norms sample.² The battery was administered to all students in every participating school and consequently the grade norms represent the natural proportion of musically select, (those participating in school music organizations), and unselected students. Separate norms are provided for each grade, with special norms for musically select students at the elementary, junior high school, and senior high school levels.

Reliability. The reliability coefficients for all tests in all grades were computed by split-halves procedures, and estimates of the reliabilities of the full-length tests

¹Ibid., p. 2.

²Edwin Gordon, Musical Aptitude Profile (Boston: Houghton Mifflin Company, 1965), p. 46.

³Ibid., p. 51.

were made through the use of the Spearman-Brown formula.¹ Reliabilities differ somewhat from grade to grade and from test to test. The reported reliability coefficients range from .66 to .85 for the individual subtests, from .80 to .92 for the three main divisions, and from .90 to .96 for the total test battery, depending on grade level. For grade five, the reliability coefficient is .91.²

Validity. Preliminary evidence on the validity of the Musical Aptitude Profile was obtained by correlating test scores with teacher ratings of students' musical talent. Gordon stated that this type of measure was somewhat suspect in that various factors, such as student attitude, personality, motivation, and achievement, may have influenced teacher judgment.³

A study of this nature was conducted by Gordon in Sandusky, Ohio. Seven well-qualified music teachers in a large school system were asked to rate the musical talent of students in their performance groups as those they considered to be in the highest ten per cent, above average fifteen per cent, average fifty per cent, below average fifteen per cent and lowest ten per cent. Students in each of these categories were then assigned a score of

¹Ibid., p. 51.

²Ibid., p. 50.

³Ibid., p. 58.

from five through one. These ratings were correlated with students' subtest, total test, and composite test scores. The correlations for the composite test scores, which ranged from .64 to .97, were the most noteworthy.¹

Another type of statistical data used in validating the Musical Aptitude Profile involved the correlation of test scores with performance criteria. Performance criteria involve an evaluation of student musical performance by judges who have no knowledge of the performer or his characteristics. Again Gordon cautioned that evidence of this type can only be considered indirect in the sense that performance achievement depends not only upon aptitude, but also upon motivation, encouragement, attitude, and quality of instruction.²

In a study of the relationship between test scores and the criteria of performance, Tarrell administered the Musical Aptitude Profile to 600 musically select students at the elementary, junior high, and senior high school levels. Students were then assigned short pieces of music to study, with ample time in which to learn them. Performances of the pieces were then tape-recorded and independently evaluated by three judges. Tarrell found that the correlations between test scores and performance ratings were .24 for band members and .41 for chorus members at the elementary level, .42 for band members and .43 for

¹Ibid., p. 59.

²Ibid.

chorus members at the junior high level, and .26 for band members and .35 for chorus members at the senior high level.¹

Gordon, commenting on the results of the Tarrell study, suggested that these correlations were lower than those reported with teacher ratings due to the high degree of selectivity of the performance groups, and the different criterion involved in specific performance ratings by judges versus general ratings of aptitude by teachers.²

More direct evidence of test validity was offered in a study by Fosha. This study was designed to assess the effects of formal musical training on Musical Aptitude Profile test scores. In his investigation, he administered the test battery to 751 musically select and 647 unselected students at the elementary and secondary levels. The students were then allowed to continue their regular musical training which consisted of group instruction and private lessons. After a semester had passed, he readministered the battery to the same students. Fosha reported that for the musically select group, the elementary students lost three percentile rank points, the junior high students gained three percentile rank points, and the senior high students lost three percentile rank points on the readministration of the test. For the unselected group, the figures showed that

¹Vernon V. Tarrell, "An Investigation of the Validity of the Musical Aptitude Profile," Journal of Research in Music Education, XIII (Winter, 1965), p. 198.

²Gordon, loc. cit.

the elementary students lost three points, the junior high students lost five points, and the senior high musically unselected students lost two points. From the data, Fosha concluded that "formal music training has a negligible effect on the Musical Aptitude Profile."¹

Further research on the effects of training was carried out in an extensive three year longitudinal study conducted by Gordon. The purpose of this study, which was completed in 1966, was to yield more conclusive evidence of the validity of the test battery as a predictor of success in instrumental music.²

For the study, Gordon wanted a sample consisting of a heterogeneous group of students with respect to musical aptitude. He therefore included all enrolled students in randomly selected elementary school classrooms, grades four and five, in four school systems. Each student was given the Musical Aptitude Profile in September, 1963, prior to the start of instrumental music instruction. The results of the pretraining administration of the test were not revealed until the study was completed. In each of the four participating school systems, students were provided with new, high quality, instruments, music, and instrumental music instructors. Each student received a minimum of two

¹Revone Fosha, "A Study of the Concurrent Validity of the Musical Aptitude Profile," Dissertation Abstracts XXV (1965), p. 5319.

²Gordon, op. cit., p. 68.

group lessons each week for a period of three years.

Five criteria were followed in evaluating musical progress. These were: (1) tape-recorded performances of short musical passages which the student prepared in advance with teacher help; (2) tape-recorded performances of short musical passages prepared in advance without teacher help; (3) tape-recorded performances of sight-reading materials; (4) teachers' evaluations of each student's musical progress; and (5) scores on a musical achievement test specifically designed for the study.¹

At the end of the three year period, student musical achievement was evaluated and correlated with pretraining aptitude test scores. Utilizing the unweighted grand composite of all five validity criteria, a predictive validity coefficient of .75 was obtained.² Gordon summarized the results of the study in this way:

. . . the coefficients of predictive validity obtained thus far for the Musical Aptitude Profile are of the same general magnitude as those usually reported for the prediction of general academic or vocational success The most important potential value of the battery . . . lies in its usefulness as a guide for diagnosing individual musical strengths and weaknesses as a basis for adapting the instructional program to individual musical needs and abilities.³

¹Edwin Gordon, "The Musical Aptitude Profile," Music Educators Journal, LIII (February, 1967), p. 54.

²Edwin Gordon, "Implications for the Use of the Musical Aptitude Profile with College and University Freshman Music Students," Journal of Research in Music Education, XV (Spring, 1967), p. 33.

³Ibid.

A secondary purpose of the longitudinal study was to determine what effects practice and training might have on test scores. The procedure used for this phase of the study was to retest each student after one and two years of instrumental music training. In order to describe the changes in aptitude scores from year to year, mean differences in scores from the first to the third year of instruction for the total experimental group were compared with mean differences from fifth to seventh grade for students who participated in the standardization program.¹

Gordon reported that the differences between the mean differences for students who received instrumental instruction and the corresponding mean differences for students in the standardization program were too small to be of any practical consequence. Hence he concluded, "it appears that formal music instruction . . . does not have any appreciable effect of Musical Aptitude Profile scores,"² and that in his judgment, the Profile "can be administered to all students, regardless of their past musical training or their current musical achievement"³

The two factors under consideration in the present study were training and socioeconomic level. The results of research relating to training have been discussed above.

¹Edwin Gordon, A Three-Year Longitudinal Predictive Validity Study of the Musical Aptitude Profile (University of Iowa Studies in the Psychology of Music, Vol. V, Iowa City: University of Iowa Press, 1967), p. 40.

²Ibid.

³Ibid.

An important study relating to the second factor was conducted by Gordon in 1966. In this study he analyzed the 1965-1966 Musical Aptitude Profile test results of 658 seventh grade students who were enrolled in two junior high schools in a large north central city. The students in these schools were technically classified as "educationally deprived" under provisions of the Elementary and Secondary School Act of 1965.¹ Gordon's stated purpose was "to present recent findings which bear specifically on the performance of culturally disadvantaged students"² on the Profile. He felt that these findings would aid in determining whether an aptitude test designed for a culturally heterogeneous population could also be used with confidence with culturally disadvantaged students. He had previously investigated the relationships of test scores to certain other environmental factors and found that (1) a lack of a favorable musical background, (characterized by membership in school performance groups and/or lessons on a musical instrument), was not a limiting factor in attaining scores at the 80th percentile and above; and (2) the relationship of home environmental characteristics to test scores was generally less than .20.³

¹Edwin Gordon, "A Comparison of the Performance of Culturally Disadvantaged Students with that of Culturally Heterogeneous Students on the Musical Aptitude Profile," Psychology in the Schools, IV (July, 1967), p. 260.

²Ibid.

³Ibid.

A comparison of the mean scores of the experimental group with those obtained from the culturally heterogeneous group showed that, in a musically unselected sample, nine out of the eleven differences were only one standard score point or less. The composite mean score difference was .7. It was also cited that approximately eight per cent of the culturally disadvantaged group under study scored above the 90th percentile of the standardization sample.¹

The results of this study led Gordon to conclude that the differences between scores obtained by culturally disadvantaged groups and scores obtained by culturally heterogeneous groups are "negligible and have no practical significance."²

¹Ibid., p. 261.

²Ibid.

CHAPTER III

PRESENTATION OF THE DATA

The purpose of this study was to investigate the effects of specialized instruction and socioeconomic level on test scores on the Musical Aptitude Profile and to evaluate the validity of the Profile as an aptitude test in relation to these two factors.

In order to study the effects of specialized instruction, it was necessary to group schools into those in which a certified music teacher taught fifth grade music in a departmentalized program, and those in which the classroom teacher taught music in a self-contained fifth grade classroom. Only those schools in the Des Moines Independent Community School District which had begun specialized instruction in fifth grade were selected for the specialized music instruction sample.

Schools were further grouped into those in target and non-target areas. A target area school was defined as one in which the school attendance in the area was based on a high concentration of children from low income families. A non-target area school was defined as any school in the Des Moines school system other than a target area school. Thus, four groups were identified, namely: (1) specialized instruction, non-target areas; (2) classroom instruction, non-target areas; (3) specialized instruction, target areas; and (4) classroom instruction, target areas.

Four schools were selected at random from within each of the above classifications, and fifteen fifth grade students were selected at random to represent each school, making a total of 240 students in the entire sample.

All fifth grade students were given the Musical Aptitude Profile in March, 1968. The test results were computerized by the Polk County Board of Education, and organized into three sets of sheets, each set containing a complete list of standard scores and percentile ranks for each student in each school. Permission for the writer to use one of these print-out sets was obtained from Dr. Carroll Childs, Director of Music, Des Moines Independent Community School District.

The print-outs contained all eleven standard scores for each student: one score for each of the seven subtests, a composite score for each of the three main divisions of the test, and a grand composite score for the entire battery. The comparisons made in the present study were based upon the mean grand composite standard score of each group under investigation. These group composite standard score means were derived from the average of the standard scores received in Tonal Imagery, Rhythm Imagery, and Musical Sensitivity by each student in the group.

The standard score means for each of the four experimental groups listed on the first page of this chapter are presented in Table I. The tabulation of scores revealed that in each division of the test and for the grand composite

mean score, the specialized instruction, non-target area group achieved at least two standard score points above the classroom instruction, non-target area group. A review of Table I also showed that the specialized instruction, target area group earned higher mean scores in all categories of the test than the classroom instruction, target area group. All four groups received their highest mean scores in the Tonal Imagery division, and their lowest mean scores in the Musical Sensitivity division.

TABLE I

STANDARD SCORE MEANS ON THE MUSICAL APTITUDE PROFILE OF 240
FIFTH GRADE STUDENTS IN NON-TARGET AND TARGET AREAS
RECEIVING SPECIALIZED OR CLASSROOM MUSIC
INSTRUCTION, DES MOINES, IOWA
MARCH, 1968

<u>GROUP</u> (N)	<u>TONAL</u> <u>IMAGERY</u>	<u>RHYTHM</u> <u>IMAGERY</u>	<u>MUSICAL</u> <u>SENSITIVITY</u>	<u>GRAND</u> <u>COMPOSITE</u>
Specialized Instruction Non-Target Areas (N=60)	51.21	50.55	48.55	50.32
Classroom Instruction Non-Target Areas (N=60)	48.98	48.43	45.01	47.45
Specialized Instruction Target Areas (N=60)	46.11	45.70	43.81	45.13
Classroom Instruction Target Areas (N=60)	45.70	43.78	40.95	43.47

To determine the effects of training and socioeconomic level on Musical Aptitude Profile scores, the four experimental groups were combined in various ways, as follows:

1. All students receiving specialized music instruction versus all students receiving classroom music instruction.
2. All students in non-target areas versus all students in target areas, regardless of training.
3. Students in non-target areas receiving specialized music instruction versus students in target areas receiving specialized music instruction.
4. Students in non-target areas receiving classroom music instruction versus students in target areas receiving classroom music instruction.
5. Students in non-target areas receiving specialized music instruction versus students in non-target areas receiving classroom music instruction.
6. Students in target areas receiving specialized music instruction versus students in target areas receiving classroom music instruction.
7. Students in non-target areas receiving specialized music instruction versus students in target areas receiving classroom music instruction.
8. Students in non-target areas receiving classroom music instruction versus students in target areas receiving specialized music instruction.

The effects of the two factors under study were evaluated by determining the statistical difference between the means of the grand composite standard score for each of the eight combinations of variables listed above. This computation was accomplished by using the Fisher t formula for testing the difference between uncorrelated means in two samples of equal size. The formula is as follows:¹

$$t = \frac{M_1 - M_2}{\sqrt{\frac{\sum x^2_1 + \sum x^2_2}{N(N-1)}}$$

In this formula, M_1 and M_2 are the means of the grand composite standard scores of the two groups in each combination, $\sum x^2_1$ and $\sum x^2_2$ are the sums of the squares of the deviations from the means of the two groups, and N is the number of students in each group. The quantity $(N-1)$ refers to the degrees of freedom. Degrees of freedom, (hereafter referred to as df), relates to the number of values of the variable that are free to vary. Whereas N is the number of observations, the quantity $(N-1)$ in the definition of variance is the number of deviations about the mean that are free to vary.²

¹J. P. Guilford, Fundamental Statistics in Psychology and Education (New York: McGraw-Hill Book Company, 1965), p. 184.

²George A. Ferguson, Statistical Analysis in Psychology and Education (New York: McGraw-Hill Book Company, 1966), p. 64.

Because of the slight differential involved, the 120 df was used in this study rather than the interpolated 119 df (120-1), and 60 df rather than 59 df (60-1).

The significance of each t ratio was then determined on the basis of Ferguson's table of the "critical values of t".¹ No one particular level of significance was adopted for this study, as the specific level of t for each combination of variables was considered to be more meaningful. However, any t failing to meet the .05 level was deemed not significant on a two-tailed test. In discussing levels of significance, Ferguson stated that:

The .05 and .01 probability levels are descriptive of our degree of confidence that a real difference exists, or that the observed difference is not due to the caprice of sampling For most practical purposes it is sufficient to designate the probability as $p \geq .05$ or $p \geq .01$ or possibly $p \geq .001$ if the result is highly significant.²

The first t ratio of the investigator's study involved the difference in the mean grand composite standard scores between all students receiving specialized instruction and all students receiving classroom instruction. The grand composite standard score means and the standard score means in Tonal Imagery, Rhythm Imagery, and Musical Sensitivity are presented in Table II. It was felt that the presentation of the three main division mean scores as well as the grand composite mean scores would provide a more complete picture

¹Ibid., p. 406.

²Ibid., p. 164.

of each group's performance on the Musical Aptitude Profile and therefore these figures were included in each table in this chapter.

Each group in Table II contained 120 students, this being the combination of target and non-target area students. The value of t was found to be 2.302 with 120 df. This result was significant at the .05 level, for which t had to be equal to or greater than 1.980.

TABLE II

STANDARD SCORE MEANS ON THE MUSICAL APTITUDE PROFILE OF 240
FIFTH GRADE STUDENTS RECEIVING SPECIALIZED OR CLASSROOM
MUSIC INSTRUCTION, DES MOINES, IOWA, MARCH, 1968

<u>GROUP</u> (N)	<u>TONAL</u> <u>IMAGERY</u>	<u>RHYTHM</u> <u>IMAGERY</u>	<u>MUSICAL</u> <u>SENSITIVITY</u>	<u>GRAND</u> <u>COMPOSITE</u>
Specialized Instruction (N=120)	48.66	48.12	46.18	47.73
Classroom Instruction (N=120)	47.34	46.10	42.98	45.46

The effects of socioeconomic level on Musical Aptitude Profile scores were assessed by comparing the means of the grand composite standard scores of students in non-target areas and students in target areas. This comparison, using the entire sample of 240 students, did not take into account the effects of training. Utilizing the mean composite scores as shown in Table III, a t of 5.027 was obtained, and

adjudged to be significant at the .001 level, as a t of 3.373 was needed for significance at this level. The non-target area group performed appreciably better on the Tonal Imagery and Rhythm Imagery divisions of the test than did the target area group, and received a mean composite score 4.58 points above the target area group.

TABLE III

STANDARD SCORE MEANS ON THE MUSICAL APTITUDE PROFILE OF 240
FIFTH GRADE STUDENTS IN NON-TARGET AREAS AND TARGET AREAS
DES MOINES, IOWA, MARCH, 1968

<u>GROUP</u> (N)	<u>TONAL</u> <u>IMAGERY</u>	<u>RHYTHM</u> <u>IMAGERY</u>	<u>MUSICAL</u> <u>SENSITIVITY</u>	<u>GRAND</u> <u>COMPOSITE</u>
Non-Target Areas (N=120)	50.09	49.49	46.78	48.88
Target Areas (N=120)	45.90	44.74	44.88	44.30

The data relating to the comparison between students in non-target areas receiving specialized instruction and students in target areas receiving specialized instruction are presented in Table IV. This combination of variables evaluated the effects of socioeconomic level on test scores, while holding the training factor constant. The resultant t , using the mean composite score of 50.32 for the non-target area group, and the mean composite score of 43.13 for the target area group, was 3.439 with 60 df. This t was

significant at the .01 level, as a t of 2.660 was required.

Looking at the results of each division of the test, it was interesting to note that the non-target area group, consisting of sixty subjects, scored approximately five mean standard points higher than did the target area group, consisting of the same number of subjects, in all three divisions. The grand composite mean differential between the groups was 5.19 points.

TABLE IV

STANDARD SCORE MEANS ON THE MUSICAL APTITUDE PROFILE OF 120
FIFTH GRADE STUDENTS IN NON-TARGET AND TARGET AREAS
RECEIVING SPECIALIZED MUSIC INSTRUCTION,
DES MOINES, IOWA, MARCH, 1968

<u>GROUP</u> <u>(N)</u>	<u>TONAL</u> <u>IMAGERY</u>	<u>RHYTHM</u> <u>IMAGERY</u>	<u>MUSICAL</u> <u>SENSITIVITY</u>	<u>GRAND</u> <u>COMPOSITE</u>
Specialized Instruction Non-Target Areas (N=60)	51.21	50.55	48.55	50.32
Specialized Instruction Target Areas (N=60)	46.11	45.70	43.81	45.13

To further ascertain the effects of socioeconomic level, while holding the training factor constant, a comparison was made between scores of students in non-target areas and target areas, all of whom had received classroom music instruction. The mean scores in each category of the test are given in Table V. In this analysis, the statistical

difference between the mean grand composite scores was 3.519 with 60 df. This t was significant at the .001 level, for which a t of 3.460 was required.

All mean scores for the classroom instruction group in non-target areas were higher than those earned by the classroom instruction group in target areas. However, the mean scores of both of these groups were lower than those received by students with specialized instruction, regardless of area.

TABLE V

STANDARD SCORE MEANS ON THE MUSICAL APTITUDE PROFILE OF 120
FIFTH GRADE STUDENTS IN NON-TARGET AND TARGET AREAS
RECEIVING CLASSROOM MUSIC INSTRUCTION,
DES MOINES, IOWA, MARCH, 1968

<u>GROUP</u> (N)	<u>TONAL</u> <u>IMAGERY</u>	<u>RHYTHM</u> <u>IMAGERY</u>	<u>MUSICAL</u> <u>SENSITIVITY</u>	<u>GRAND</u> <u>COMPOSITE</u>
Classroom Instruction Non-Target Areas (N=60)	48.98	48.43	45.01	47.45
Classroom Instruction Target Areas (N=60)	45.70	43.78	40.95	43.47

The training factor was examined in the next two comparisons. The first of these involved both non-target area groups and the second involved both target area groups. In each comparison, one group received classroom instruction and the other received specialized instruction. Thus, in

both cases, the socioeconomic level was constant and the effects of the difference in training could be analyzed. In Table VI is shown the mean standard scores for all non-target area students, sixty of whom received specialized instruction and sixty of whom received classroom instruction. The obtained t in this comparison was 2.176, slightly higher than the 2.000 figure needed for significance at the .05 level.

The non-target area groups in this analysis earned the highest mean scores of all groups in the investigation; however, the students with specialized instruction achieved higher mean scores in each category of the test than did the students with classroom instruction, as can be seen in Table VI.

TABLE VI

STANDARD SCORE MEANS ON THE MUSICAL APTITUDE PROFILE OF 120
FIFTH GRADE STUDENTS IN NON-TARGET AREAS RECEIVING
SPECIALIZED OR CLASSROOM MUSIC INSTRUCTION,
DES MOINES, IOWA, MARCH, 1968

<u>GROUP</u> (N)	<u>TONAL</u> <u>IMAGERY</u>	<u>RHYTHM</u> <u>IMAGERY</u>	<u>MUSICAL</u> <u>SENSITIVITY</u>	<u>GRAND</u> <u>COMPOSITE</u>
Specialized Instruction Non-Target Areas (N=60)	51.21	50.55	48.55	50.32
Classroom Instruction Non-Target Areas (N=60)	48.98	48.43	45.01	47.45

The second combination of variables used in examining the relationship between Profile scores and training included all target area students, those with specialized instruction and those with classroom instruction. Utilizing the grand composite mean standard score of 45.13 for the specialized instruction group and the grand composite mean standard score of 43.47 for the classroom instruction group, as shown in Table VII, a t of 1.230 was obtained. As this t did not reach the .05 level, it was deemed not significant.

A review of the mean scores did show, however, that the students who had received specialized instruction achieved higher mean scores in all categories of the test battery than did the students with classroom instruction.

TABLE VII

STANDARD SCORE MEANS ON THE MUSICAL APTITUDE PROFILE OF 120
FIFTH GRADE STUDENTS IN TARGET AREAS RECEIVING
SPECIALIZED OR CLASSROOM MUSIC INSTRUCTION,
DES MOINES, IOWA, MARCH, 1968

<u>GROUP</u> (N)	<u>TONAL</u> <u>IMAGERY</u>	<u>RHYTHM</u> <u>IMAGERY</u>	<u>MUSICAL</u> <u>SENSITIVITY</u>	<u>GRAND</u> <u>COMPOSITE</u>
Specialized Instruction Target Areas (N=60)	46.11	45.70	43.81	45.13
Classroom Instruction Target Areas (N=60)	45.70	43.78	40.95	43.47

The last relationship to be investigated was that between scores on the Musical Aptitude Profile and the two factors, training and socioeconomic level, considered together. Two comparisons were made to demonstrate the interaction of all variables combined.

The first comparison was between the specialized instruction, non-target area group and the classroom instruction, target area group, both of whose mean scores are presented in Table VIII. The obtained t in this comparison was 5.257 and deemed significant at the .001 level, for which a t of 3.460 was necessary. The differences in the group mean scores in Tonal Imagery, Rhythm Imagery, and Musical Sensitivity were of particular interest as, in each division, over six mean standard points separated the scores of the non-target area group and the target area group.

TABLE VIII

STANDARD SCORE MEANS ON THE MUSICAL APTITUDE PROFILE OF 120 FIFTH GRADE STUDENTS IN NON-TARGET AREAS RECEIVING SPECIALIZED MUSIC INSTRUCTION AND IN TARGET AREAS RECEIVING CLASSROOM MUSIC INSTRUCTION, DES MOINES, IOWA, MARCH, 1968

<u>GROUP</u> (N)	<u>TONAL</u> <u>IMAGERY</u>	<u>RHYTHM</u> <u>IMAGERY</u>	<u>MUSICAL</u> <u>SENSITIVITY</u>	<u>GRAND</u> <u>COMPOSITE</u>
Specialized Instruction Non-Target Areas (N=60)	51.21	50.55	48.55	50.32
Classroom Instruction Target Areas (N=60)	45.70	43.78	40.95	43.47

The data pertaining to the other combination in this last classification, namely, students in non-target areas receiving classroom instruction versus students in target areas receiving specialized instruction, are presented in Table IX. This t ratio, employing a mean grand composite score of 47.45 for the classroom instruction group and a mean grand composite score of 45.13 for the specialized instruction group, was found to be 1.706. The statistical difference between these two means was not significant.

It was noted from the figures in Table IX that the classroom instruction, non-target area group did somewhat better in each division of the test battery than did the target area, specialized instruction group.

TABLE IX

STANDARD SCORE MEANS ON THE MUSICAL APTITUDE PROFILE OF 120
FIFTH GRADE STUDENTS IN NON-TARGET AREAS RECEIVING
CLASSROOM MUSIC INSTRUCTION AND IN TARGET AREAS
RECEIVING SPECIALIZED MUSIC INSTRUCTION,
DES MOINES, IOWA, MARCH, 1968

<u>GROUP</u> (N)	<u>TONAL</u> <u>IMAGERY</u>	<u>RHYTHM</u> <u>IMAGERY</u>	<u>MUSICAL</u> <u>SENSITIVITY</u>	<u>GRAND</u> <u>COMPOSITE</u>
Classroom Instruction Non-Target Areas (N=60)	48.98	48.43	45.01	47.45
Specialized Instruction Target Areas (N=60)	46.11	45.70	43.81	45.13

CHAPTER IV

SUMMARY AND CONCLUSIONS

It was the purpose of this study to investigate the effects of specialized instruction and socioeconomic level on test scores on the Gordon Musical Aptitude Profile and to evaluate the validity of the Musical Aptitude Profile as an aptitude test in relation to these two factors.

The study was limited to the results of the March, 1968, administration of the Profile to fifth grade students in the Des Moines Community School District. In order to determine the relationship of specialized instruction to test scores, schools in the Des Moines system were grouped into those in which a certified music teacher taught fifth grade music in a departmentalized program and those in which the classroom teacher taught music in a self-contained fifth grade classroom. Schools were further grouped into those in non-target and target areas to study the effects of the socioeconomic level factor. Thus, four groups were identified: (1) specialized instruction, non-target areas; (2) classroom instruction, non-target areas; (3) specialized instruction, target areas; and (4) classroom instruction, target areas.

Four schools were selected at random from within each of the above classifications, and fifteen fifth grade students were selected at random to represent each school, making a total of 240 students in the entire sample.

The four experimental groups were arranged in different combinations of variables, and comparisons of scores were made, based upon the grand composite standard score mean of each group in the combination. The statistical difference between the means of the grand composite standard scores was then computed, using the Fisher t formula for testing the difference between uncorrelated means in samples of equal size.¹ On the basis of Ferguson's table of the critical values of t,² the significance of each t ratio was determined. For each comparison, the specific level of significance was reported, and any t failing to meet the .05 level was deemed not significant.

I. SUMMARY

A significant difference between the means of the grand composite standard scores on the Musical Aptitude Profile was found when the following groups were compared:

1. All students receiving specialized music instruction versus all students receiving classroom music instruction.
2. All students in non-target areas versus all students in target areas, regardless of training.

¹J. P. Guilford, Fundamental Statistics in Psychology and Education (New York: McGraw-Hill Book Company, 1965), p. 184.

²George A. Ferguson, Statistical Analysis in Psychology and Education (New York: McGraw-Hill Book Company, 1966), p. 64.

3. Students in non-target areas receiving specialized music instruction versus students in target areas receiving specialized music instruction.
4. Students in non-target areas receiving classroom music instruction versus students in target areas receiving classroom music instruction.
5. Students in non-target areas receiving specialized music instruction versus students in non-target areas receiving classroom music instruction.
6. Students in non-target areas receiving specialized music instruction versus students in target areas receiving classroom music instruction.

No significant difference between the means of the grand composite standard scores on the Musical Aptitude Profile was found when the following groups were compared:

1. Students in target areas receiving specialized music instruction versus students in target areas receiving classroom music instruction.
2. Students in non-target areas receiving classroom music instruction versus students in target areas receiving specialized music instruction.

II. CONCLUSIONS

From the results of studies concerning the validity of the Musical Aptitude Profile, Gordon had concluded that environmental factors and musical training had a relatively

minimal effect on aptitude test performance. The present study was undertaken to further examine the relationship of these two factors to scores on the Profile.

An examination of the data presented in this investigation led the writer to conclude that:

1. Students in non-target areas performed appreciably better on the Musical Aptitude Profile than students in target areas.
2. In general, students receiving specialized music instruction achieved higher scores on the Musical Aptitude Profile than students receiving classroom music instruction.

The results of the present study indicated that there is a significant difference in performance on the Musical Aptitude Profile of fifth grade students which may be associated with the effects of training and socioeconomic level. Considering the apparent influence of these two factors on the scores of the Profile, the author questions the extent to which the Musical Aptitude Profile should be used solely as an instrument with which to measure innate musical capacity.

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